LeA34821_SeqList SEQUENCE LISTING <110> Bayer Aktiengesellschaft <120> Acetylcholine receptor subunits <130> Le A 34 821 <140> US/09/941,179 <141> 2001-08-27 <150> DE 100 42 177.6 <151> 2000-08-28 <160> 17 <170> PatentIn Ver. 2.1 <210> 1 <211> 45 <212> PRT <213> Torpedo californica <400> 1 Asp Phe Ala Ile Val His Met Thr Lys Leu Leu Leu Asp Tyr Thr Gly Lys Ile Met Trp Thr Pro Pro Ala Ile Phe Lys Ser Tyr Cys Glu Ile Ile Val Thr His Phe Pro Phe Asp Gln Gln Asn Cys Thr <210> 2 <211> 1869 <212> DNA <213> Artificial Sequence <220> <221> CDS <222> (1)..(1866) <223> Description of Artificial Sequence: Modified_alpha 4 subunit of the chicken nicotinic acetylcholine receptor <400> 2 48 atg gga ttt ctc gtg tcg aag gga aac ctc ctc ctc ctg ctg tgt gcc Met Gly Phe Leu Val Ser Lys Gly Asn Leu Leu Leu Leu Cys Ala agc atc ttc ccc gct ttc ggc cac gtg gaa acg cga gcc cat gcg gag 96 Ser Ile Phe Pro Āla Phe Ğİy His Val Ğlu Thr Arg Āla His Ālā Ğlü

gag cgc ctc ctg aag aaa ctc ttc tcc ggg tat aac aag tgg tcc cgt Glu Arg Leu Leu Lys Lys Leu Phe Ser Gly Tyr Asn Lys Trp Ser Arg

ccc gtc gcc aac att tcg gat gtg gtc ctg gtc cgc ttc ggc ttg tcc Pro Val Ala Asn Ile Ser Asp Val Val Leu Val Arg Phe Gly Leu Ser 144

192

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aat Asn	gtg Val	tgg Trp	gtg Val	aag Lys 85	cag Gln	gag Glu	tgg Trp	cac His	gac Asp 90	tac Tyr	aag Lys	ctg Leu	cgc Arg	tgg Trp 95	gac Asp	288
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atc Ile	tgg Trp	cgg Arg 115	ccg Pro	gac Asp	ata Ile	gtc Val	ctc Leu 120	tac Tyr	aac Asn	aat Asn	gcc Ala	gac Asp 125	ggc Gly	aac Asn	ttc Phe	384
gag Glu	gta val 130	acg Thr	ctg Leu	gcg Ala	acg Thr	aag Lys 135	gcg Ala	act Thr	ttg Leu	aat Asn	tat Tyr 140	acg Thr	gga Gly	cgt Arg	gtg Val	432
gag Glu 145	tgg Trp	cgc Arg	ccg Pro	ccg Pro	gct Ala 150	atc Ile	tac Tyr	aag Lys	tcc Ser	tcg Ser 155	tgc Cys	gag Glu	atc Ile	gac Asp	gtg Val 160	480
gaa Glu	tac Tyr	ttc Phe	ccg Pro	ttc Phe 165	gac Asp	cag Gln	cag Gln	acg Thr	tgc Cys 170	gtc Val	atg Met	aag Lys	ttc Phe	ggc Gly 175	tcg Ser	528
tgg Trp	aca Thr	tat Tyr	gac Asp 180	aaa Lys	gct Ala	aag Lys	ata Ile	gac Asp 185	ttg Leu	gtg Val	agc Ser	atg Met	cat His 190	agc Ser	cat His	576
gtg Val	gac Asp	caa Gln 195	ctg Leu	gac Asp	tac Tyr	tgg Trp	gaa Glu 200	agc Ser	ggg Gly	gag Glu	tgg Trp	gtc Val 205	atc Ile	att Ile	aat Asn	624
gcc Ala	gtg Val 210	Gly	aat Asn	tac Tyr	aac Asn	agc Ser 215	aag Lys	aaa Lys	tat Tyr	gaa Glu	tgc Cys 220	Cys	aca Thr	gag Glu	atc Ile	672
tac Tyr 225	cct Pro	gat Asp	ata Ile	act Thr	tac Tyr 230	Ser	ttc Phe	att Ile	atc Ile	cgg Arg 235	Arg	ctg Leu	ccg Pro	ctg Leu	ttc Phe 240	720
tac Tyr	aca Thr	atc Ile	aat Asn	ttg Leu 245	Ile	att Ile	ccc Pro	tgc Cys	ctg Leu 250	Leu	atc ille	tcc Ser	tgc Cys	ttg Leu 255	act Thr	768
gtc Val	ctg Leu	gtc Val	ttc Phe 260	. Tyr	cta Leu	CCC Pro	tct Ser	gag Glu 265	Cys	gga	gag Glu	aag Lys	ata Ile 270	: Int	ttg Leu	816
tgc Cys	ato	tct Ser 275	· val	ı ctg Leu	ı cta ı Leu	tcc Ser	cto Leu 280	ı Thr	gtg Val	j tto Ph€	ctg Leu	ctg Leu 285	Leu	atc Ile	aca Thr	864
gag Glu	ato Ile 290	e Ile	cct Pro	tct Ser	acc Thr	tcc Ser 295	. Fer	g gto u val	ato Ile	cco Pro	cto Lei 300	1 116	gga Gly	gag Glu	ı tat ı Tyr	912
ctg Leu 305	ı Let	tto Phe	acc Thr	at <u>c</u> Met	ata Ile 310	e Phe	gto Va	c acc	ttg Lei	g to Sei 31! Page	2	ato e Ile	ato Elle	act Thr	gtc Val 320	

ttt Phe	gtg Val	ctc Leu	aac Asn	gta Val 325	cac His	cac His	cgt Arg	tca Ser	cca Pro 330	cgt Arg	acc Thr	cac His	acg Thr	atg Met 335	cct Pro	1008
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aaa Lys	cct Pro	atg Met	tgc Cys 420	aaa Lys	tcc Ser	cct Pro	tct Ser	gga Gly 425	cag Gln	tac Tyr	tca Ser	atg Met	ctg Leu 430	cac His	cct Pro	1296
gag Glu	ccc Pro	cca Pro 435	cag Gln	gtg Val	acg Thr	tgt Cys	tcc ser 440	tct Ser	ccg Pro	aag Lys	ccc Pro	tcc Ser 445	tgc Cys	cac His	ccc Pro	1344
ctg Leu	agt Ser 450	gac Asp	acc Thr	cag Gln	acc Thr	aca Thr 455	tct Ser	atc Ile	tca Ser	aaa Lys	ggc Gly 460	aga Arg	tcg Ser	ctc Leu	agt Ser	1392
gtt Val 465	cag Gln	cag Gln	atg Met	tac Tyr	agc Ser 470	ccc Pro	aat Asn	aag Lys	aca Thr	gag Glu 475	gaa Glu	ggg Gly	agc Ser	atc Ile	cgc Arg 480	1440
tgt Cys	agg Arg	tcc Ser	cga Arg	agc Ser 485	atc Ile	cag Gln	tac Tyr	tgt Cys	tac Tyr 490	ctg Leu	cag Gln	gag Glu	gac Asp	tct Ser 495	tcc Ser	1488
cag Gln	acc Thr	aat Asn	ggc Gly 500	cac His	tct Ser	agt Ser	gcc Ala	tct Ser 505	cca Pro	gcg Ala	tcg Ser	cag Gln	cgc Arg 510	tgc Cys	cac His	1536
ctc Leu	aat Asn	gaa Glu 515	gag Glu	cag Gln	ccc Pro	cag Gln	cac His 520	aag Lys	ccc Pro	cac His	cag Gln	tgc Cys 525	aag Lys	tgt Cys	aag Lys	1584
tgc Cys	aga Arg 530	Lys	gga Gly	gag Glu	gca Ala	gct Ala 535	ggc Gly	aca Thr	ccg Pro	act Thr	caa Gln 540	GIY	agc Ser	aag Lys	agc Ser	1632
сас ніs 545	agc Ser	aac Asn	aaa Lys	gga Gly	gaa Glu 550	His	ctc Leu	gtg val	ctg Leu	atg Met 555	Ser	cca Pro	gcc Ala	ctg Leu	aag Lys 560	1680
ctg Leu	gcg Ala	gtg Val	gaa Glu	ggg Gly	gtc Val	cac His	tac Tyr	att Ile	Ala	gac Asp Page	His	ctg Leu	cga Arg	gca Ala	gaa Glu	1728

gat gca gat ttc tca gtg aag gaa gac tgg aag tac gta gca atg gtc Asp Ala Asp Phe Ser Val Lys Glu Asp Trp Lys Tyr Val Ala Met Val 580 585 590
att gac cgg atc ttt ctc tgg atg ttc atc atc gtg tgt ttg ctg ggg Ile Asp Arg Ile Phe Leu Trp Met Phe Ile Ile Val Cys Leu Leu Gly 595 600 605
acc gtt ggg ctc ttc ctc ccg ccg tgg ctg gca gga atg atc taa Thr Val Gly Leu Phe Leu Pro Pro Trp Leu Ala Gly Met Ile 610 615 620
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<220> <223> Description of Artificial Sequence: Modified alpha 4 subunit of the chicken nicotinic acetylcholine receptor
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Glu Arg Leu Leu Lys Lys Leu Phe Ser Gly Tyr Asn Lys Trp Ser Arg 35 40 45
Pro Val Ala Asn Ile Ser Asp Val Val Leu Val Arg Phe Gly Leu Ser 50 55 60
Ile Ala Gln Leu Ile Asp Val Asp Glu Lys Asn Gln Met Met Thr Thr 65 70 75 80
Asn Val Trp Val Lys Gln Glu Trp His Asp Tyr Lys Leu Arg Trp Asp 85 90 95
Pro Gln Glu Tyr Glu Asn Val Thr Ser Ile Arg Ile Pro Ser Glu Leu 100 105 110
Ile Trp Arg Pro Asp Ile Val Leu Tyr Asn Asn Ala Asp Gly Asn Phe 115 120 125
Glu Val Thr Leu Ala Thr Lys Ala Thr Leu Asn Tyr Thr Gly Arg Val 130 135 140
Glu Trp Arg Pro Pro Ala Ile Tyr Lys Ser Ser Cys Glu Ile Asp Val 145 150 155 160
Glu Tyr Phe Pro Phe Asp Gln Gln Thr Cys Val Met Lys Phe Gly Ser 165 170 175
Trp Thr Tyr Asp Lys Ala Lys Ile Asp Leu Val Ser Met His Ser His 180 185 190
Val Asp Gln Leu Asp Tyr Trp Glu Ser Gly Glu Trp Val Ile Ile Asn Page 4

200

Ala Val Gly Asn Tyr Asn Ser Lys Lys Tyr Glu Cys Cys Thr Glu Ile 210 215 220 Tyr Pro Asp Ile Thr Tyr Ser Phe Ile Ile Arg Arg Leu Pro Leu Phe 225 230 235 Tyr Thr Ile Asn Leu Ile Ile Pro Cys Leu Leu Ile Ser Cys Leu Thr val Leu Val Phe Tyr Leu Pro Ser Glu Cys Gly Glu Lys Ile Thr Leu 260 265 270 Cys Ile Ser Val Leu Leu Ser Leu Thr Val Phe Leu Leu Leu Ile Thr 275 280 285 Glu Ile Ile Pro Ser Thr Ser Leu Val Ile Pro Leu Ile Gly Glu Tyr 290 295 300 Leu Leu Phe Thr Met Ile Phe Val Thr Leu Ser Ile Ile Ile Thr Val 305 310 315 320 Phe Val Leu Asn Val His His Arg Ser Pro Arg Thr His Thr Met Pro 325 330 335 Asp Trp Val Arg Arg Val Phe Leu Asp Ile Val Pro Arg Leu Leu Phe 340 345 350 Met Lys Arg Pro Ser Thr Val Lys Asp Asn Cys Lys Leu Ile Glu 355 360 365 Ser Met His Lys Leu Thr Asn Ser Pro Arg Leu Trp Ser Glu Thr Asp 370 375 380 Met Glu Pro Asn Phe Thr Thr Ser Ser Ser Pro Ser Pro Gln Ser Asn 385 390 395 400 Glu Pro Ser Pro Thr Ser Ser Phe Cys Ala His Leu Glu Glu Pro Ala 405 410 415 Lys Pro Met Cys Lys Ser Pro Ser Gly Gln Tyr Ser Met Leu His Pro 420 430 Glu Pro Pro Gln Val Thr Cys Ser Ser Pro Lys Pro Ser Cys His Pro 435 440 445 Leu Ser Asp Thr Gln Thr Thr Ser Ile Ser Lys Gly Arg Ser Leu Ser 450 460 Val Gln Gln Met Tyr Ser Pro Asn Lys Thr Glu Glu Gly Ser Ile Arg 465 470 475 480 Cys Arg Ser Arg Ser Ile Gln Tyr Cys Tyr Leu Gln Glu Asp Ser Ser 485 490 495 Gln Thr Asn Gly His Ser Ser Ala Ser Pro Ala Ser Gln Arg Cys His 500 505 510 Leu Asn Glu Glu Gln Pro Gln His Lys Pro His Gln Cys Lys Cys Lys 515 520 525 Cys Arg Lys Gly Glu Ala Ala Gly Thr Pro_Thr Gln Gly Ser Lys Ser Page 5

530		
220		

His Ser Asn Lys Gly Glu His Leu Val Leu Met Ser Pro Ala Leu Lys

535

Leu Ala Val Glu Gly Val His Tyr Ile Ala Asp His Leu Arg Ala Glu

Asp Ala Asp Phe Ser Val Lys Glu Asp Trp Lys Tyr Val Ala Met Val

Ile Asp Arg Ile Phe Leu Trp Met Phe Ile Ile Val Cys Leu Leu Gly 600

Thr Val Gly Leu Phe Leu Pro Pro Trp Leu Ala Gly Met Ile 615

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31

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<212> DNA

<213> Artificial Sequence

<223> Description of Artificial Sequence: Primer

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<210> 6

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<212> DNA

<213> Artificial Sequence

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<221> CDS

<222> (1)..(1893)

<223> Description of Artificial Sequence: Modified_alpha 4 subunit of the chicken nicotinic acetylcholine receptor

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agc atc ttc ccc gct ttc ggc cac gtg gaa acg cga gcc cat gcg gag 96 Ser Ile Phe Pro Ala Phe Gly His Val Glu Thr Arg Ala His Ala Glu 30 25 20

gag Glu	cgc Arg	ctc Leu 35	ctg Leu	aag Lys	aaa Lys	ctc Leu	ttc Phe 40	tcc Ser	ggg Gly	tat Tyr	aac Asn	aag Lys 45	tgg Trp	tcc Ser	cgt Arg	144
ccc Pro	gtc val 50	gcc Ala	aac Asn	att Ile	tcg Ser	gat Asp 55	gtg Val	gtc val	ctg Leu	gtc val	cgc Arg 60	ttc Phe	ggc Gly	ttg Leu	tcc Ser	192
ata Ile 65	gcc Ala	cag Gln	ctc Leu	atc Ile	gat Asp 70	gtt val	gat Asp	gag Glu	aag Lys	aac Asn 75	caa Gln	atg Met	atg Met	acc Thr	aca Thr 80	240
aat Asn	gtg Val	tgg Trp	gtg Val	aag Lys 85	cag Gln	gag Glu	tgg Trp	cac His	gac Asp 90	tac Tyr	aag Lys	ctg Leu	cgc Arg	tgg Trp 95	gac Asp	288
ccc Pro	cag Gln	gag Glu	tat Tyr 100	gaa Glu	aac Asn	gtc Val	aca Thr	tcc Ser 105	atc Ile	cga Arg	atc Ile	ccc Pro	tca Ser 110	gag Glu	ctc Leu	336
atc Ile	tgg Trp	agg Arg 115	ccg Pro	gac Asp	att Ile	gtc Val	cta Leu 120	tac Tyr	aac Asn	aat Asn	gct Ala	gat Asp 125	ggt Gly	gac Asp	ttt Phe	384
gca Ala	gtc Val 130	acc Thr	cac His	ctg Leu	acc Thr	aaa Lys 135	gcc Ala	cac His	ctc Leu	ttc Phe	tat Tyr 140	gat Asp	ggg Gly	aga Arg	att Ile	432
aaa Lys 145	tgg Trp	atg Met	cca Pro	cct Pro	gcc Ala 150	atc Ile	tac Tyr	aaa Lys	agc Ser	tcc Ser 155	tgc Cys	agc Ser	atc Ile	gat Asp	gtt Val 160	480
acc Thr	ttc Phe	ttc Phe	ccc Pro	ttt Phe 165	gat Asp	cag Gln	caa Gln	aac Asn	tgt Cys 170	Lys	atg Met	aaa Lys	ttt Phe	ggc Gly 175	tct Ser	528
tgg Trp	aca Thr	tat Tyr	gac Asp 180	Lys	gct Ala	aag Lys	ata Ile	gac Asp 185	ttg Leu	gtg Val	agc Ser	atg Met	cat His 190	agc Ser	cat His	576
cgc Arg	ggg Gly	acc Thr 195	aac Asn	gtg Val	gtg Val	gag Glu	ctg Leu 200	GIY	gtg Val	gac Asp	caa Gln	ctg Leu 205	gac Asp	tac Tyr	tgg Trp	624
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aag Lys 225	Lys	tat Tyr	gaa Glu	tgc Cys	tgc Cys 230	Thr	gag Glu	atc Ile	tac Tyr	cct Pro 235	ASL	ata Ile	act Thr	tac Tyr	tcc Ser 240	720
tto Phe	att Elle	atc lle	cgg Arg	agg Arg 245	Leu	ccg Pro	ctg Lei	j tto i Phe	tac Tyr 250	' Inf	ato Ile	aat Asr	ttg Leu	ato Ile 255	att Ile	768
CCC Pro	tgo Cys	ctg Leu	ctt Lei 260	ı Ile	tcc Ser	tgc Cys	tt <u>c</u> Lei	act Thr 265	· vai	cto Lei	g gto I Va	tto Phe	tac Tyr 270	Let	ccc Pro	816
tc1 Sei	gaç Gli	g tgo u Cys	gga Gly	a gag ⁄Gli	g aag Lys	g ata 5 Il€	aco Thr	ttg Lei	g tgo u Cys	ato S Ile Page	e Sei	gtç Va	cto Lei	g cta i Lei	tcc Ser	864

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275	280		28

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ctg Leu 305	gtc val	atc Ile	ccc Pro	ctg Leu	ata Ile 310	gga Gly	gag Glu	tat Tyr	ctg Leu	ctc Leu 315	ttc Phe	acc Thr	atg Met	ata Ile	ttt Phe 320	960
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tct Ser	gga Gly	cag Glr 435	Tyr	tca Ser	atg Met	ctg Leu	cac His 440	PIO	gag Glu	ccc Pro	cca Pro	cag Gln 445	· • u	acg Thr	tgt Cys	1344
tcc Ser	tct Ser 450	Pro	j aag Lys	ccc Pro	tcc Ser	tgc Cys 455	HIS	ccc Pro	ctg Leu	agt Ser	gad Asp 460	, ,,,,,	caç Glr	acc Thr	aca Thr	1392
tct Ser 465	· Ile	tca e Sei	a aaa ^ Lys	ggc Gly	aga Arg 470	Ser	cto	agt Ser	gtt Val	cag Glr 475	1 011	g ato n Mei	g tad Tyr	ago Ser	ccc Pro 480	1440
aat Asr	aag n Lys	g aca	a gaq r Gli	g gaa u Glu 485	т Сту	agc Ser	ato	cgo e Arg	tgt g Cys 490	2 716	g to	c cga r Arg	a ago g Sei	ato r Ile 495	cag e Gln	1488
ta Ty	c tgʻ r Cy:	t ta s Ty	c cti r Lei 500	u Gir	g gag n Gli	gaq ı Asp	tc1 Sei	t too n Sei 50!	ווט	g aco	c aa r As	t gg n Gl	c ca y Hi 51	-	t agt r Ser	1536
gc: Al	c tc a Se	t cc r Pr 51	o Al	g tcg a sei	g caq r Gli	g cgo n Aro	tg g Cy: 52	5 HI:	c ct s Le	c aa u As	t ga n Gl	a ga u G1 52	u G,	g cc n Pr	c cag o Gln	1584
ca	c aa	g cc	c ca	c ca	g tg	c aag	g tg	t aa	g tg	c ag Pag	a aa e 8	g gg	a ga	g gc	a gct	1632

HIS	Lys 530	Pro	ніѕ	Gln	Cys	Lys 535	Cys	Le Lys	A348 Cys	21_S Arg	eqLi Lys 540	st Gly	Glu	Ala	Ala	
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ccg Pro 625	Trp	ctg Leu	gca Ala	gga Gly	atg Met 630	atc Ile	taa									1896
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Gly Thr Pro Thr Gln Gly Ser Lys Ser His Ser Asn Lys Gly Glu His 545 550 560
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Page 13

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Lys Trp Met Pro Pro Ala Ile Tyr Lys Ser Ser Cys Ser Ile Asp Val 145 150 160

Thr Phe Phe Pro Phe Asp Gln Gln Asn Cys Lys Met Lys Phe Gly Ser 165 170

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Tyr Leu Asp Ile Thr Phe Asn Phe Ile Ile Arg Arg Leu Pro Leu Phe 225 230 230

Tyr Thr Ile Asn Leu Ile Ile Pro Cys Leu Leu Ile Ser Cys Leu Thr 245 250 255

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Cys Ile Ser Val Leu Leu Ser Leu Thr Val Phe Leu Leu Leu Ile Thr 275 280 285

Glu Ile Ile Pro Ser Thr Ser Leu Val Ile Pro Leu Ile Gly Glu Tyr 290 295 300

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Met Lys Arg Pro Ser Thr Val Lys Asp Asn Cys Lys Leu Ile Glu 355 360 365

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